



Supplement of

Spatially coordinated airborne data and complementary products for aerosol, gas, cloud, and meteorological studies: the NASA ACTIVATE dataset

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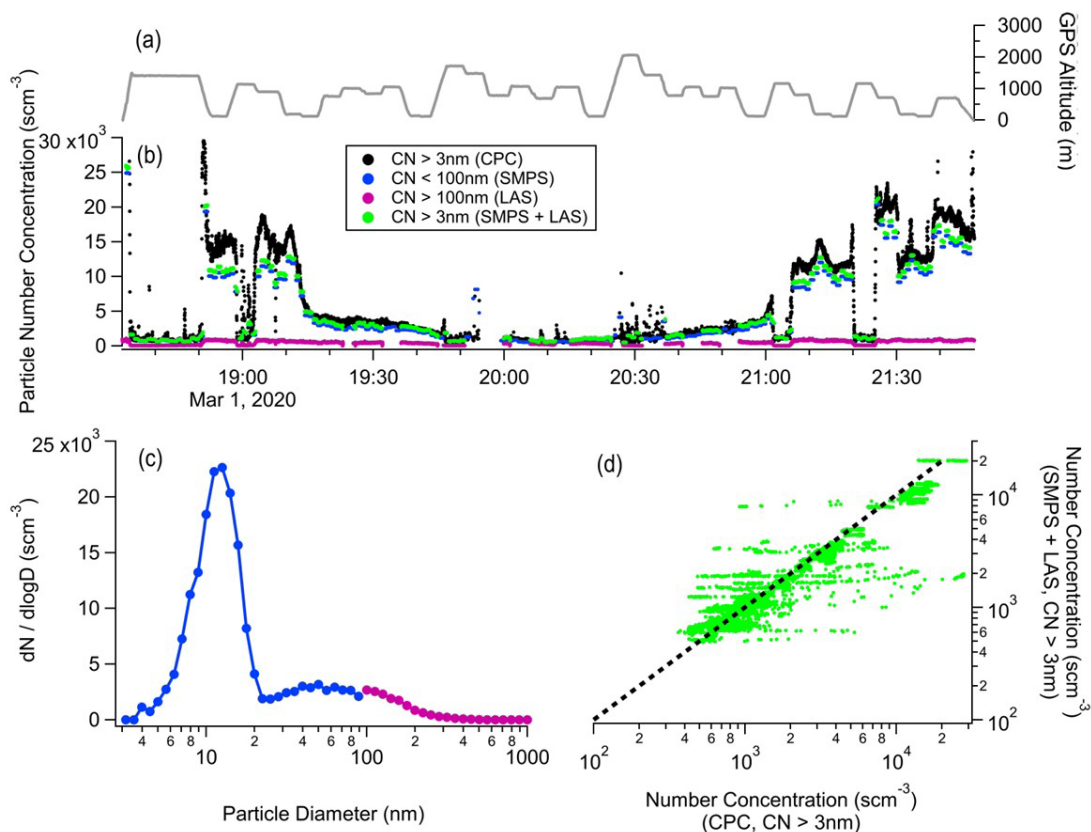
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Table S1. Instrument performance summary for the King Air and HU-25 Falcon during ACTIVATE. OK = functioned well during the entire flight; “So So” = some loss of data quantity/quality; N/A = no usable data. Deployments are separated by blank rows: Deployment 1 (RF1-RF22), Deployment 2 (RF23-RF40), Deployment 3 (RF41-RF61), Deployment 4 (RF62-RF93), Deployment 5 (RF94-RF148), Deployment 6 (RF149-RF179).

RF	Date	King Air			Falcon												
		AVAPS	HSRL-2	RSP	DLH	Trace Gas	TAMMS	LARGE CDP/CAS	FCDP/2DS	LARGE Microphysics	LARGE Optical	CCN	AMS	PILS	AC3 Cloud Water	CVI	State Variables
1	2/14/2020	OK	OK	OK	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	N/A	OK
2	2/15/2020	OK	OK	OK	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
3	2/17/2020	OK	OK	OK	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
4	2/21/2020	N/A	N/A	N/A	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	N/A	OK	OK
5	2/22/2020	N/A	N/A	N/A	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
6	2/22/2020	N/A	N/A	N/A	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
7	2/23/2020	N/A	N/A	N/A	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	N/A	OK	OK
8	2/23/2020	N/A	N/A	N/A	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	N/A	OK	OK
9	2/27/2020	OK	OK	OK	OK	So So	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
10	2/28/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
11	2/28/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
12	2/29/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
13	3/1/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
14	3/1/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
15	3/2/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
16	3/6/2020	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK	OK	OK	OK	OK	OK	OK
17	3/8/2020	OK	OK	N/A	OK	OK	OK	So So	So So	OK	OK	OK	OK	OK	OK	OK	OK
18	3/8/2020	OK	OK	N/A	OK	OK	OK	So So	So So	OK	OK	OK	OK	OK	OK	OK	OK
19	3/9/2020	OK	OK	OK	OK	OK	OK	So So	So So	OK	OK	OK	OK	OK	OK	OK	OK
20	3/11/2020	OK	OK	OK	OK	OK	OK	So So	So So	OK	OK	OK	So So	OK	OK	OK	OK
21	3/12/2020	OK	OK	OK	OK	OK	OK	So So	So So	OK	OK	OK	So So	OK	OK	OK	OK
22	3/12/2020	OK	OK	OK	OK	OK	OK	So So	So So	OK	OK	OK	So So	OK	OK	OK	OK

108	1/19/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
109	1/24/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
110	1/24/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
111	1/26/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
112	1/26/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
113	1/27/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
114	1/27/2022	OK	OK	N/A	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
115	2/1/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
116	2/2/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
117	2/3/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
118	2/3/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK	OK	So So	OK
119	2/5/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
120	2/15/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
121	2/15/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
122	2/16/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
123	2/16/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
124	2/19/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
125	2/19/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
126	2/22/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
127	2/22/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
128	2/26/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
129	2/26/2022	N/A	N/A	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
130	3/2/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
131	3/3/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
132	3/3/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
133	3/4/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
134	3/4/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
135	3/7/2022	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK
136	3/7/2022	N/A	N/A	N/A	OK	OK	OK	OK	OK	OK	OK	OK	OK	So So	OK	OK	OK



13

Figure S1: Closure analysis for particle number concentration measurements derived from an ultrafine CPC, SMPS, and LAS. (a-b) Time series data are shown for Research Flight 14 (1 March 2020), (c) an average size distribution during a MinAlt leg at approximately UTC 21:17, and (d) a scatterplot of the integrated number concentration derived from LAS+SMPS instruments against number concentration directly measured by a CPC. For panel d, orthogonal distance regression (ODR) linear fitting resulted in a slope of 0.722, intercept of 433 cm^{-3} , and coefficient of determination (r^2) of 0.861. Mean absolute error (MAE) and mean absolute percentage error (MAPE) values are 1219 cm^{-3} and 24.9%, respectively.